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SUITE 1600	3623	

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DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/684,272	CROW ET AL.
	Examiner	Art Unit
	Michael C. Heck	3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2003*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-72* is/are pending in the application.

    4a) Of the above claim(s) *21-29 and 54-63* is/are withdrawn from consideration.

5)☒ Claim(s) *18* is/are allowed.

6)☒ Claim(s) *1-9, 13-20, 30-33, 36-53, 64-66, 69-72* is/are rejected.

7)☒ Claim(s) *10-12, 34, 35, 67 and 68* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1,2,3,4*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Applicant's election of Group I in the replies filed on 29 June 2005 is acknowledged.   Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2.   The following is a First Office Action in response to the application filed 10 October 2003 and the amendments filed 29 June 2005. Claims 1-72 are pending in this application and claims 1-20, 30-53 and 64-72 have been examined on the merits as discussed below.

Claims 21-29 and 54-63 have been canceled pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made without traverse in the reply on 29 June 2005.

Drawings

3.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 610, 1130, 2740 and 3100.

4.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 1140 and 2760.

5.   The drawings are objected to because:

- Figure 5, reference character 560 is titled "Concept Extractor(s)", however the specification on page 8 refers to reference character 560 as -- Concept Scorer(s) --.

- Figure 27, reference character 2750 relates to the "no" answer, therefore will generate a <u>relaxing</u> modification predicted to bring number of candidates within range, however, the specification on page 39 indicates that reference character 2750 relates to the "yes" answer and a <u>constraining</u> modification predicted to bring the number of candidates within (or closer to) the range is generated.

- Figure 30 indicates "Candidate Name" and "Type" as column headers and a check box as a row indicator, however the actual names and types under the column headers do not align with the columns, which makes the actual names and type not match with the row indicators.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an

application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

Specification

6.   The disclosure is objected to because of the following informalities:

-   Starting page 5 to page 68, the applicant uses "Example 1 ... 55" for titles.

    The following paragraphs generally are not examples, therefore remove the

    term "Example 1 ... 55" and leave only the title of the section to be covered.

-   On page 6, line 6, delete "analyzes structured the job candidate data" and

    insert -- analyzes *the structured* job candidate data --.

-   On page 21, line 6, delete "the software can recognize that all there are

    alternative", and insert -- the software can recognize that all **three** are

    alternative --.

-   On Page 31, line 11, delete "exemplaryimplementation" and insert --

    exemplary implementation --.

-   On page 32, lines 26-27, it appears the phrase "For example, "Project &

    Product Manager" becomes "Product and Product Manager"." should be --

For example, "Project & Product Manager" becomes "**Project** and Product Manager". --.

- On page 38, line 10, delete "role-based modification to the query 2422" and insert -- role-based modification **2535** to the query 2422 --.

- On page 39, line 1, delete "2750" and insert -- **2740** --. Please refer to the drawing objection above.

- On page 39, line 3, delete "2760" and insert -- **2750** --. Please refer to the drawing objection above.

- On page 40, line 3, delete "and suggest that be changed to not required" and insert -- and suggest that **the identified component** be changed to not required --.

- On page 41, lines 15-16, delete "and selects concepts from to add to the job requisition" and insert -- and selects **from concepts** to add to the job requisition --.

- On page 45, line 9, delete "freshness value can matched" and insert -- freshness value can **be** matched --.

- On page 66, lines 25-26, delete "an exemplary graphical user interface depicting" and insert -- an exemplary graphical user interface **3100** depicting --. Please refer to the drawing objection above.

The above citation is a mere guide. Applicant is requested to review the specification thoroughly to eliminate additional errors. Appropriate correction is required.

Claim Objections

7.   **Claim 17** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Claim 17 identifies one or more computer-readable media comprising computer-executable instructions for performing the method of claim 1. Simply having in ones possession a disk or CD that has computer-executable instructions for performing the method of claim 1 would be an infringement to claim 17 without infringing claim 1, since claim 1 identifies the method steps of representing job candidate data for a job candidate. The method steps of claim 1 would not be infringed since the method steps have not been executed. *Please See MPEP 608.01 (n), "Infringement Test" for dependent claims.* A proper dependent claim shall not conceivably be infringed by anything, which would not also infringe the basic claim.

8.   **Claim 36** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Claim 36 identifies one or more computer-readable media comprising computer-executable instructions for performing the method of claim 30. Simply having in ones possession a disk or CD that has computer-executable instructions for performing the method of claim 30 would be an

infringement to claim 36 without infringing claim 30, since claim 30 identifies the method steps of associating a score with a concept extracted from electronically stored job candidate data comprising at least a portion of a resume for a job candidate. The method steps of claim 30 would not be infringed since the method steps have not been executed. *Please See MPEP 608.01 (n), "Infringement Test" for dependent claims.* A proper dependent claim shall not conceivably be infringed by anything, which would not also infringe the basic claim.

9.   **Claim 48** is objected to because of the following informalities: "stopword" should be -- stop word --. Appropriate correction is required.

10.   **Claim 49** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Claim 49 identifies one or more computer-readable media comprising computer-executable instructions for performing the method of claim 38, however claim 38 is dependent to claim 1. Simply having in ones possession a disk or CD that has computer-executable instructions for performing the method of claim 38 would be an infringement to claim 49 without infringing claim 38, since claim 38 further identifies the method steps of representing job candidate data for a job candidate. The method steps of claim 38 would not be infringed since the method steps have not been executed. *Please See MPEP 608.01 (n), "Infringement Test" for dependent claims.* A proper dependent claim shall not conceivably be infringed by anything, which would not also infringe the basic claim.

Claim Rejections - 35 USC § 112

11.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12.   **Claim 1-16, 30-35, 38-53 and 64-66** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1-16 and 38-53 includes receiving the job candidate data; extracting one or more concepts from the job candidate data; and storing data indicating the concepts as a representation of the job candidate data. Claim 64-66 includes converting the job candidate data into a representation in an n-dimensional concept space, where the representation comprises a point associated with a plurality of concepts, wherein the coordinates of the point indicate concept scores for concepts associated with the axes. "Concept" is undefined. For examination purposes, "concept" is interpreted to be a word and/or term describing a desired characteristic for a job.

13.   **Claim 16** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 16 indicates the job candidate data comprises assessment results of the job candidate, however the claim does not define what an "assessment result" is. The Examiner has defined assessment result to include a questionnaire, test or job application, which can be in the form of electronic mail or a word document.

14.   **Claim 35** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. Claim 35 indicates the recency factor is calculated according

to the following: k/(number of years). The variable "k" is undefined. For examination

purposes the recency factor is considered to be 1.0.

15.   **Claim 49** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. Claim 49 claims a one or more computer-readable media

comprising computer-executable instructions for performing the method of claim 38,

however claim 38 is dependent to claim 1. Claim 17 identifies one or more computer-

readable media comprising computer-executable instructions for performing the method

of claim 1. Claim 17 includes dependent claim 38. It is not clear if the Applicant's intent

was to claim segments of the claimed invention to be independently identified by

computer-readable media comprising computer-executable instructions for performing

the method steps so identified, i.e., claim 17 includes all of claim 1 and the dependent

claims to include dependent claim 38, and claim 49 includes only that portion of claim 1

that relates to claim 38 and the dependent claims to claim 38 excluding claims 1-16.

Claim Rejections - 35 USC § 101

16.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 1-16, 30-35, 38-53 and 64-70 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of:

(1) whether the invention is within the technological arts; and

(2) whether the invention produces a useful, concrete, and tangible result.

For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena) that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful arts" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For the process claim to pass muster, the recited process must somehow apply, involve, use, or advance the technological arts. In the present case, **claims 1-16, 30-35, 38-53 and 64-70** only recites an abstract idea. As to **claim 1**, the recited steps of receiving the job candidate data; extracting one or more concepts from the job candidate data; and storing data indicating the concepts as a representation of the job candidate data does not apply, involve, use, or advance the technological arts since all of the recited steps can be performed in the mind of the user or by use of a pencil and paper and/or by a trivial use of technology, i.e. storing. The method only constitutes an idea for representing job candidate data for a job candidate, therefore, deemed to be directed to non-statutory subject matter. As to **claim 30**, the recited steps of determining an experience level with respect to the concept for the candidate based at least on the job candidate data; and storing a score indicating the experience level

with respect to the concept for the candidate does not apply, involve, use, or advance the technological arts since all of the recited steps can be performed in the mind of the user or by use of a pencil and paper and/or by a trivial use of technology, i.e. storing. The method only constitutes an idea for associating a score with a concept extracted form electronically stored job candidate data comprising at least a portion of a resume for a job candidate, therefore, deemed to be directed to non-statutory subject matter. As to **claim 64**, the recited steps of converting the job candidate data into a representation in an n-dimensional concept space; and storing the representation in the n-dimensional concept space does not apply, involve, use, or advance the technological arts since all of the recited steps can be performed in the mind of the user or by use of a pencil and paper and/or by a trivial use of technology, i.e. storing. The method only constitutes an idea for representing job candidate data for a job candidate, therefore, deemed to be directed to non-statutory subject matter. As to **claim 67**, the recited steps of receiving characteristics desired to fill the position; matching the characteristics desired to fill the position to a set of a plurality of job candidates via an n-dimensional concept space does not apply, involve, use, or advance the technological arts since all of the recited steps can be performed in the mind of the user or by use of a pencil and paper. The method only constitutes an idea for finding a job candidate suitable to fill a position, therefore, deemed to be directed to non-statutory subject matter. As to **claim 69**, the recited steps of converting the information of the job candidate into a conceptual representation of the job candidate; and storing the conceptual representation of the job candidate does not apply, involve, use, or advance the technological arts since all of the

recited steps can be performed in the mind of the user or by use of a pencil and paper and/or by a trivial use of technology, i.e. storing. The method only constitutes an idea for representing information of a job candidate, therefore, deemed to be directed to non-statutory subject matter.

As to technological arts recited in the preamble, mere recitation in the preamble (i.e., intended or field of use) or mere implications of employing a machine or article of manufacture to perform some or all of the recited steps does not confer statutory subject matter to an otherwise abstract idea unless there is positive recitation in the claim as a whole to breathe life and meaning into the preamble. In the present case, none of the recited steps are directed to anything in the technological arts as explained above. Looking at the claim as a whole, nothing in the body of the claim recites any structure or functionality to suggest that a computer performs the recited steps. Therefore, the preamble is taken to merely recite a field of use.

Additionally, for a claimed invention to be statutory, the claimed invention must produce a useful, concrete, and tangible result. In the present case, the claimed invention extracts concepts from job candidate data, determining an experience level with respect to the concept, converting the data into and n-dimensional concept space, and matching the characteristics desired via an n-dimensional concept space (i.e., repeatable, useful and tangible).

Looking at the claims as a whole, nothing in the body of the claims recite any structure or functionality to suggest that a computer performs a task. While claims

recite storing data, this amounts to only a trivial use of technology where nothing is done (i.e., computing) to breathe life into the invention.

Although the recited process produces a useful, concrete, and tangible result, since the claimed invention, as a whole, is not within the technological arts as explained above, the same rejection as stated above for claims 1, 30, 64, 67 and 69 applies to **claims 2-16, 31-35, 38-53, 65-66, 68 and 70.**

Claim Rejections - 35 USC § 103

17.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18.   **Claims 1-3, 5-9, 13-17, 19-20, 30-33, 36-37, 64-66 and 69-72** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sobotka et al. (U.S. Patent 5,197,004) in view of Gallivan (U.S. Patent 6,778,995). Sobotka et al. disclose a conceptualization of job candidate information comprising:

- **[Claim 1]** receiving the job candidate data (Abstract, Sobotka et al. teach accepting as input a computer-readable version of the applicant's resume.);

- extracting one or more concepts from the job candidate data (col. 3, lines 45-53, Sobotka et al. teach converting resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities.); and

- storing data indicating the concepts as a representation of the job candidate data (col. 4, lines 33-45, Sobotka et al. teach an extractor program extracts

words and word groups considered relevant to the categorization process. The words and word groups returned can be encoded in electronic form and stored on any type of computer data storage device.).

Sobotka et al. fail to explicitly teach concepts, however Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning. Each unstructured document is analyzed for syntactic content by extracting literal terms and phrases. Related documents are identified by finding highly correlated term and phrase pairings. Those documents corresponding to concepts are grouped into clusters (col. 2, lines 46-63). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify Sobotka et al. with the concepts of Gallivan since Sobotka et al. teach extracting words or word groups which match word patterns (the groups, job categories, indicators and buzzwords) in a knowledge base (col. 5, lines 49-53). Automatically and accurately reviewing a large amount of data and matching the data to a desired outcome saves time and money. Sobotka et al. teach an automated computerized system for resume analysis where combining frame-based and rule-based techniques and incorporating probabilistic methods allows for the classification of an applicant with a high degree of accuracy (Sobotka et al.: col. 3, lines 38-44). Gallivan teaches text mining to efficiently generate cluster groupings in a multi-dimensional concept space (Gallivan: col. 1, lines 7-10). Therefore, the combination of Sobotka et al. and Gallivan teach automated, accurate and efficient data extraction and matching. Both Sobotka et al. and Gallivan teach document text searching therefore there is a motivation or suggestion to combine. There is a reasonable expectation of success since Sobotka et al. teach matching word

patterns in a knowledge base and Gallivan teach using the documents to finding highly

correlated terms and phrase pairings corresponding to concepts. Sobotka et al. and

Gallivan in combination teach all the claim limitations as indicated above.

- **[Claim 2]** the extracting is performed via an ontology (Sobotka et al.: col. 4, lines 33-49, Sobotka et al. teach data passes through an extractor program which extracts words and word groups considered relevant to the categorization process. A knowledge base contains a set of word patterns, also known as a grammar, which specify which words and word groups will be extracted. The Examiner interprets the "grammar" to be an ontology.).

- **[Claim 3]** active entries in the ontology are limited to those approved by a human reviewer (Sobotka et al.: col. 5, lines 8-10, Sobotka et al. teach groups and job categories can be readily created to meet the needs of particular employers.).

- **[Claim 5]** assigning at least one of the concepts an associated concept score indicating a level of experience for at least one of the concepts (Sobotka et al.: col. 5, line 67 to col. 6, line 3 and col. 8, lines 38-42, Sobotka et al. teach for each job category, a weight determination algorithm assigns to each job title, degree, buzzword and designator under the job category an integer value which is directly proportional to its strength as an indicator. The weighting and summing operations are performed with the final results comprising the job category or categories most applicable to the applicant whose resume is being analyzed.).

- **[Claim 6]** receiving other job candidate data for a plurality of other job candidates (Sobotka et al.: Abstract and col. 3, lines 45-49, Sobotka et al. teach accepting as input a computer-readable version of the applicant's resume. The method converts resumes into a series of correctly ordered blocks.);

- extracting a plurality of concepts from the other job candidate data (Sobotka et al.: col. 3, lines 45-53, Sobotka et al. teach converting resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities. Gallivan: col. 2, lines 46-63, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning. Each unstructured document is analyzed for syntactic content by extracting literal terms and phrases. Related documents are identified by finding highly

correlated term and phrase pairings. Those documents corresponding to concepts are grouped into clusters.);

- assigning the concepts within the other job candidate data associated concept scores representing experience for the plurality of concepts (Sobotka et al.: col. 5, line 67 to col. 6, line 3 and col. 8, lines 38-42, Sobotka et al. teach for each job category, a weight determination algorithm assigns to each job title, degree, buzzword and designator under the job category an integer value which is directly proportional to its strength as an indicator. The weighting and summing operations are performed with the final results comprising the job category or categories most applicable to the applicant whose resume is being analyzed.); and

- searching within an n-dimensional space for one or more job candidates, wherein the job candidates are represented in the n-dimensional space via the concept scores (Gallivan: col. 2, lines 46-63, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning.).

- **[Claim 7]** n is greater than 100,000 (Gallivan: col. 2, lines 46-63, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning. The Examiner interprets the process can be performed for any value of n.).

- **[Claim 8]** n is greater than 1,000,000 (Gallivan: col. 2, lines 46-63, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning. The Examiner interprets the process can be performed for any value of n.).

- **[Claim 9]** n is greater than 3,000,000 (Gallivan: col. 2, lines 46-63, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning. The Examiner interprets the process can be performed for any value of n.).

- **[Claim 13]** at least one parent concept is extracted based on detection of a child concept related to the parent concept in a hierarchical concept arrangement (Sobotka et al.: col. 4, lines 56-68 and col. 5, lines 49-58, Sobotka et al. teach a hierarchical structure of a knowledge base. At the top of the hierarchy are job category groups. Under each job category there are various indicators, and under each indicator there may be various buzzwords. The Extractor program extracts words and word groups, which match the word patterns (the groups, job categories, indicators and buzzwords) in the knowledge base. After the process is completed, the jog category or categories are selected that are most appropriate. The Examiner interprets

the parent concepts is determined from the child concept, i.e., indicators and buzzwords.).

- **[Claim 14]** at least one parent concept is extracted based on detection of multiple child concepts related to the parent concept in a hierarchical concept arrangement (Sobotka et al.: col. 4, lines 56-68 and col. 5, lines 49-58, Sobotka et al. teach a hierarchical structure of a knowledge base. At the top of the hierarchy are job category groups. Under each job category there are various indicators, and under each indicator there may be various buzzwords. The Extractor program extracts words and word groups, which match the word patterns (the groups, job categories, indicators and buzzwords) in the knowledge base. After the process is completed, the jog category or categories are selected that are most appropriate. The Examiner interprets the parent concepts is determined from the child concept, i.e., indicators and buzzwords.);

- wherein a confidence score for the parent concept is calculated based on accumulation of confidence scores for the multiple child concepts (Sobotka et al.: col. 5, line 67 to col. 6, line 3, Sobotka et al. teach that for each job category, a weight determination algorithm assigns to each job title, degree, buzzword, and designator under the job category an integer value, which is directly proportional to its strength as an indicator.).

- **[Claim 15]** the job candidate data comprises a resume of the job candidate (Sobotka et al.: Abstract, Sobotka et al. teach accepting as input a computer-readable version of the applicant's resume.).

- **[Claim 16]** the job candidate data comprises assessment results of the job candidate (Gallivan: col. 4, lines 61-67, Gallivan teaches the individual documents include all forms and types of unstructured data, including electronic mail and word processing documents. The Examiner interprets "all forms" to include a questionnaire, test or job application.).

- **[Claim 30]** determining an experience level with respect to the concept for the candidate based at least on the job candidate data (Sobotka et al.: col. 2, lines 32-59, col. 3, lines 45-53, Sobotka et al. teach frame-based systems use frame data structures having slots, values and possibly rules to represent the knowledge of experts. Each "slot" (e.g. Name, Degree, Experience, etc) has a value representing the relevant data based on the applicant's resume. The method converts resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities.); and

- storing a score indicating the experience level with respect to the concept for the candidate (Sobotka et al.: col. 4, lines 50-55, col. 5, line 67 to col. 6, line 3 and col. 8, lines 38-42, Sobotka et al. teach for each job category, a weight determination algorithm assigns to each job title, degree, buzzword and designator under the job category an integer value which is directly proportional to its strength as an indicator. The weighting and summing operations are performed with the final results comprising the job category or categories most applicable to the applicant whose resume is being analyzed. The computer uses memory for storing all or part of the knowledge base and extractor program.).

- **[Claim 31]** the determining is performed with reference to a length of service with respect to the concept based at least upon analysis of the job candidate data (Sobotka et al.: col. 2, lines 32-59, Sobotka et al. teach frame-based systems use frame data structures having slots, values and possibly rules to represent the knowledge of experts. Each "slot" (e.g. Name, Degree, Experience, etc) has a value representing the relevant data based on the applicant's resume. The Examiner interprets "experience" to be related to time.).

- **[Claim 32]** the determining is performed with reference to recency of the concept with respect to the concept based at least upon analysis of the job candidate data (Sobotka et al.: col. 2, lines 19-65, Sobotka et al. teach an applicant who graduated with an electrical engineering degree 10 years ago, worked as a circuit designer for a couple of years, returned to school, received an MBA, and is now working as a financial executive. Frame-based systems use frame data structures having slots, values and possibly rules to represent the knowledge of experts. Each "slot" (e.g. Name, Degree, Experience, etc) has a value representing the relevant data based on the applicant's resume. Notice the rule indicating that if an MBA is added to an applicant's frame, the engineering degree is effectively cancelled. The Examiner interprets the example to represent "recency".).

- **[Claim 33]** the determining is performed with reference to identification of job skills identified in the job candidate data and related in an ontology to the concept (Sobotka et al.: col. 4, lines 33-49, Sobotka et al. teach data passes through an extractor program which extracts words and word groups considered relevant to the categorization process. A knowledge base contains a set of word patterns, also known as a grammar, which specify which words and word groups will be extracted. The Examiner interprets the "grammar" to be an ontology.).

- **[Claim 64]** converting the job candidate data into a representation in an n-dimensional concept space (Sobotka et al.: Abstract and col. 3, lines 45-53,

Sobotka et al. teach accepting as input a computer-readable version of the applicant's resume and converting resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities. Gallivan: col. 2, lines 46-48, Gallivan teaches generating logical clusters of documents in a multi-dimensional concept space for modeling semantic meaning.); and

- storing the representation in the n-dimensional concept space (Sobotka et al.: col. 4, lines 33-45, Sobotka et al. teach an extractor program extracts words and word groups considered relevant to the categorization process. The words and word groups returned can be encoded in electronic form and stored on any type of computer data storage device.).

- **[Claim 65]** the representation comprises a point having coordinates for a plurality of axes associated with a plurality of concepts, wherein the coordinates of the point indicate concept scores for concepts associated with the axes (Gallivan: col. 9, lines 61-62 and col. 10, lines 8-11, Gallivan teaches each cluster represents multi-dimensional data modeled in a three-dimensional display space. Each cluster represents a grouping of points corresponding to comments sharing a common set of related terms or phrases.).

- **[Claim 66]** at least one of the concept scores represents expertise in one of the concepts based on analysis of the job candidate data (Sobotka et al.: col. 5, line 67 to col. 6, line 3 and col. 8, lines 38-42, Sobotka et al. teach for each job category, a weight determination algorithm assigns to each job title, degree, buzzword and designator under the job category an integer value which is directly proportional to its strength as an indicator. The weighting and summing operations are performed with the final results comprising the job category or categories most applicable to the applicant whose resume is being analyzed.).

- **[Claim 69]** converting the information of the job candidate into a conceptual representation of the job candidate (Sobotka et al.: col. 3, lines 45-53, Sobotka et al. teach converting resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities.); and

- storing the conceptual representation of the job candidate (Sobotka et al.: col. 4, lines 33-45, Sobotka et al. teach an extractor program extracts words and word groups considered relevant to the categorization process. The words

and word groups returned can be encoded in electronic form and stored on any type of computer data storage device.).

- **[Claim 70]** the information comprises a resume of the job candidate (Sobotka et al.: Abstract, Sobotka et al. teach accepting as input a computer-readable version of the applicant's resume.).

Claims 17, 19, 20, 36-37 and 71-72 substantially recite the same limitations as that of claims 1-2, 5-6, 30 and 64-66 with the distinction of the recited method being a software system and computer readable medium. Hence the same rejection for claims 1-2, 5-6, 30 and 64-66 as applied above applies to claims 17, 19, 20, 36-37 and 71-72.

19.   **Claims 4 and 38-53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sobotka et al. (U.S. Patent 5,197,004) in view of Gallivan (U.S. Patent 6,778,995) and further in view of Wical (U.S. Patent 5,887,120). As to claim 4, Sobotka et al. and Gallivan disclose a conceptualization of job candidate information but fail to teach the extracting is performed via detecting a synonym of a concept in the job candidate data. Sobotka et al. teach converting resumes into a series of correctly ordered blocks that are processed by an extractor to locate and extract words and word groups containing information believed to be relevant to the analysis of an applicant's capabilities. Data passes through an extractor program, which extracts words and word groups considered relevant to the categorization process. A knowledge base contains a set of word patterns, also known as a grammar, which specify which words and word groups will be extracted (Sobotka et al.: col. 3, lines 45-53 and col. 4, lines 33-49). Wical teach the hierarchically structured concepts contained within the static ontologies may be semantic derivatives and/or linguistic derivatives of the high level concept (Wical: col. 5,

lines 43-45). The Examiner interprets "linguistic derivatives" to be synonyms. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the teachings of Sobotka et al. and Gallivan to include hierarchically structured concepts containing linguistic derivatives of Wical since Sobotka et al. teach using an extractor which uses a predefined pattern language (Sobotka et al.: col. 3, lines 45-53). Automatically and accurately reviewing a large amount of data and matching the data to a desired outcome saves time and money. Sobotka et al. teach an automated computerized system for resume analysis where combining frame-based and rule-based techniques and incorporating probabilistic methods allows for the classification of an applicant with a high degree of accuracy (Sobotka et al.: col. 3, lines 38-44). Gallivan teaches text mining to efficiently generate cluster groupings in a multi-dimensional concept space (Gallivan: col. 1, lines 7-10). Wical teaches a knowledge catalog provides unique infrastructure to accurately represent concepts that define knowledge (Wical: col. 2, lines 56-59). Therefore, the combination of Sobotka et al., Gallivan and Wical teach automated, accurate and efficient data extraction and matching. Sobotka et al., Gallivan and Wical teach document text searching therefore there is a motivation or suggestion to combine. There is a reasonable expectation of success since Sobotka et al. teach matching word patterns in a knowledge base; Gallivan teach using the documents to finding highly correlated terms and phrase pairings corresponding to concepts; and Wical teach generating theme concepts for each theme term in an input discourse through the use of a knowledge catalog.

Sobotka et al., Gallivan and Wical in combination teach all the claim limitations as

indicated above.

- **[Claim 38]** extracting one or more concepts via application of rules to the job candidate data by a heuristic term extractor (Sobotka et al.: col. 2, lines 3-6 and col. 3, line 39-44, Sobotka et al. teach general techniques used in creating expert systems include using rules which employ the expert's procedural knowledge. By using a combination of frame-based and rule-based techniques, and further by incorporating probabilistic methods, the system classifies an applicant according to employment potential. Wical: col. 2, lines 14-22 and 56-60, and col. 12, lines 7-10, Wical teaches the theme vector processor generates theme concepts for each theme term in the input discourse through use of a knowledge catalog. The knowledge catalog includes a set of static ontologies to define knowledge. The theme vector processor executes a plurality of heuristic routines to generate the theme strengths for each theme.).

- **[Claim 39]** the method is performed by a system have one or more ontologies, and the extracting via application of rules extracts a concept not appearing in the ontologies as a concept (Sobotka et al.: col. 2, lines 3-6 and col. 3, line 39-44, Sobotka et al. teach general techniques used in creating expert systems include using rules which employ the expert's procedural knowledge. By using a combination of frame-based and rule-based techniques, and further by incorporating probabilistic methods, the system classifies an applicant according to employment potential. Wical: col. 5, lines 5-12, Wical teaches the static ontologies are relational such that linking of one or more static ontologies, or portions thereof, result in a very detailed organization of knowledge concepts. Linking or cross referencing among two or more static ontologies results in many combinations of knowledge hierarchical structures.).

- **[Claim 40]** the extracting via application of rules extracts a concept not before encountered (Wical: col. 5, lines 5-12, Wical teaches the static ontologies are relational such that linking of one or more static ontologies, or portions thereof, result in a very detailed organization of knowledge concepts. Linking or cross referencing among two or more static ontologies results in many combinations of knowledge hierarchical structures.).

- **[Claim 41]** the heuristic term extractor extracts at least one job skill in the job candidate data as a concept (Sobotka et al.: col. 8, lines 29-33, Sobotka et al. teach a knowledge base is created containing word patterns which indicate

skill in a particular job category. These word patterns are weighted to reflect their relative strength as skill indicators.).

- **[Claim 42]** the heuristic term extractor extracts concepts by identifying a portion of the job candidate data as a job skills list and extracts at least one job skill in the job skills list as a concept (Sobotka et al.: col. 8, lines 29-33, Sobotka et al. teach a knowledge base is created containing word patterns which indicate skill in a particular job category. These word patterns are weighted to reflect their relative strength as skill indicators.).

- **[Claim 43]** the heuristic term extractor identifies job skills lists at least via detection of commas therein (Wical: col. 6, lines 4-7, Wical teach the linguistic engine processes the input discourse by analyzing the grammatical or contextual aspects, as well as the stylistic and thematic attributes of the input discourse.).

- **[Claim 44]** the heuristic term extractor identifies a possible job skills list at least based on the form of the possible job skills list (Sobotka et al.: col. 8, lines 29-33, Sobotka et al. teach a knowledge base is created containing word patterns which indicate skill in a particular job category. These word patterns are weighted to reflect their relative strength as skill indicators.).

- **[Claim 45]** the heuristic term extractor identifies a possible job skills list as a job skills list at least by detecting in the possible job skills list one or more job skills already classified in an ontology as job skill (Sobotka et al.: col. 8, lines 29-33, Sobotka et al. teach a knowledge base is created containing word patterns which indicate skill in a particular job category. These word patterns are weighted to reflect their relative strength as skill indicators.).

- **[Claim 46]** the heuristic term extractor identifies a possible job skills list as a job skills list at least by detecting one or more keywords in the possible job skills list (Sobotka et al.: col. 8, lines 29-33, Sobotka et al. teach a knowledge base is created containing word patterns which indicate skill in a particular job category. These word patterns are weighted to reflect their relative strength as skill indicators.).

- **[Claim 47]** the heuristic term extractor extracts at least one job title in the job candidate data as a concept (Gallivan: col. 5, lines 44-47, Gallivan teaches that during text analysis, the text analyzer identifies terms and phrases and extracts concepts in the form of known phrases that are stored in a lexicon maintained in the database. Sobotka et al.: col. 5, line 49 to col. 6, line 2, Sobotka et al. teach an extractor program scans data and extracts words and word groups which match the word patterns (the group, job categories, indicators, and buzzwords) in the knowledge base. For each job category, a

weight determination algorithm assigns to each job title an integer value, which is directly proportional to its strength as an indicator.).

- **[Claim 48]** the heuristic term extractor removes one or more common stop words from the job title in the job candidate data (Gallivan: col. 6, lines 48-49, Gallivan teaches each document in the document set is preprocessed to remove stop words.).

- **[Claim 50]** the heuristic term extractor extracts at least one job title in the job candidate data as a concept (Gallivan: col. 5, lines 44-47, Gallivan teaches that during text analysis, the text analyzer identifies terms and phrases and extracts concepts in the form of known phrases that are stored in a lexicon maintained in the database. Sobotka et al.: col. 5, line 49 to col. 6, line 2, Sobotka et al. teach an extractor program scans data and extracts words and word groups which match the word patterns (the group, job categories, indicators, and buzzwords) in the knowledge base. For each job category, a weight determination algorithm assigns to each job title an integer value, which is directly proportional to its strength as an indicator.).

- **[Claim 51]** the heuristic term extractor extracts a management experience concept from the job candidate data (Sobotka et al.: col. 5, lines 11-20 and 49 to col. 6, line 2, Sobotka et al. teach each job category has related indicators and each indicator may have an attendant list of buzzwords. The presence of these buzzwords in a particular resume increases the probability that the applicant should be classified in the job categories with which these buzzwords are associated. Typical indicators, which can be considered as logical groupings of buzzwords include "management". An extractor program scans data and extracts words and word groups, which match the word patterns (the group, job categories, indicators, and buzzwords) in the knowledge base. For each job category, a weight determination algorithm assigns to each job title, degree, buzzword, and designator under the job category an integer value, which is directly proportional to its strength as an indicator.).

- **[Claim 52]** management experience is extracted based at least on a job title extracted from the job candidate data (Gallivan: col. 5, lines 44-47, Gallivan teaches that during text analysis, the text analyzer identifies terms and phrases and extracts concepts in the form of known phrases that are stored in a lexicon maintained in the database. Sobotka et al.: col. 5, lines 11-20 and 49 to col. 6, line 2, Sobotka et al. teach each job category has related indicators and each indicator may have an attendant list of buzzwords. The presence of these buzzwords in a particular resume increases the probability that the applicant should be classified in the job categories with which these buzzwords are associated. Typical indicators, which can be considered as

logical groupings of buzzwords include "management". An extractor program scans data and extracts words and word groups, which match the word patterns (the group, job categories, indicators, and buzzwords) in the knowledge base. For each job category, a weight determination algorithm assigns to each job title, degree, buzzword, and designator under the job category an integer value, which is directly proportional to its strength as an indicator.).

- **[Claim 53]** management experience is extracted based at least on the presence of management-indicative key words within the job candidate data (Gallivan: col. 5, lines 44-47, Gallivan teaches that during text analysis, the text analyzer identifies terms and phrases and extracts concepts in the form of known phrases that are stored in a lexicon maintained in the database. Sobotka et al.: col. 5, lines 11-20 and 49 to col. 6, line 2, Sobotka et al. teach each job category has related indicators and each indicator may have an attendant list of buzzwords. The presence of these buzzwords in a particular resume increases the probability that the applicant should be classified in the job categories with which these buzzwords are associated. Typical indicators, which can be considered as logical groupings of buzzwords include "management". An extractor program scans data and extracts words and word groups, which match the word patterns (the group, job categories, indicators, and buzzwords) in the knowledge base. For each job category, a weight determination algorithm assigns to each job title, degree, buzzword, and designator under the job category an integer value, which is directly proportional to its strength as an indicator.).

Claims 49 substantially recite the same limitations as that of claims 38 with the distinction of the recited method being a computer readable medium. Hence the same rejection for claims 38 as applied above applies to claims 49.

Allowable Subject Matter

20.   **Claims 10-12, 34 and 35** would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, and under 35 U.S.C. 101 as set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

21.   **Claims 67-68** would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 101 set forth in this Office action.

22.   **Claim 18** is allowed.

Conclusion

23.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

- Clark et al. (U.S. Patent 5,164,897) disclose an automated method for selecting personnel matched to job criteria.

- Register et al. (U.S. Patent 5,371,807) disclose a method and apparatus for text classification.

- Caid et al. (U.S. Patent 5,794,178) disclose visualization of information using graphical representations of context vector based relationships and attributes.

- Fayyad et al. (U.S. Patent 6,263,334) disclose a density-based indexing method for efficient execution of high dimensional nearest-neighbor queries on large databases.

- Clyde et al. (Clyde et al, An Object-oriented Implementation of an Adaptive Classification of Job Openings, Utah State University, 1995 [GOOGLE]) disclose the automatic classification of job openings using a learning system that generates classification rules including concept drift, and a classifier.

Any inquiry concerning this communication or earlier communications from the
Examiner should be directed to Michael C. Heck whose telephone number is (571) 272-
6730. The Examiner can normally be reached Monday thru Friday between the hours
of 8:30am - 4:30pm. If attempts to reach the examiner by telephone are unsuccessful,
the examiner's supervisor, Tariq R. Hafiz can be reached on (571) 273-6729.

Any response to this action should be mailed to:

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                            "**DRAFT**"]

mch
15 September 2005

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